

1                   **DOUBLE TRIGGER ELECTRIC STAPLER**

2    BACKGROUND OF THE INVENTION

3    1. Field of the Invention

4                 The present invention relates to an electric stapler, and more particularly  
5    to an electric stapler that can be triggered to staple paper from either side of the  
6    electric stapler.

7    2. Description of Related Art

8                 With reference to Fig. 5, a conventional electric stapler (not numbered)  
9    comprises a base assembly (60), a housing (61) and a stapling mechanism (62).  
10   The base assembly (60) has a base (not numbered), a control circuit (not shown),  
11   a switch (not shown) and a trigger (63). The base has a front (not numbered), a  
12   top (not numbered) and a cavity (not shown). The top of the base has an  
13   elongated slot (not numbered) defined through the top. The control circuit is  
14   mounted in the cavity in the base and electrically connects to the stapling  
15   mechanism (62) that is mounted in the housing (61). The switch is a limit switch  
16   and is mounted in the cavity in the base and connects electrically to the control  
17   circuit. The trigger (63) is connected to the switch and has an outside end (not  
18   numbered) extending out through the elongated slot.

19                 The housing (61) has a front recess (611), a bottom edge (not numbered)  
20    and an upper cavity (not numbered). The bottom edge attaches to the base, the  
21    front recess (611) exposes the stapling mechanism (62) and the top of the base,  
22    the elongated slot and the trigger (63). The stapling mechanism (62) is mounted  
23    in the upper cavity in the housing and has a staple driver solenoid (not shown)  
24    and a metal staple driver (not shown). The staple driver solenoid is mounted

1 around the metal staple driver and connects electrically to the control circuit in  
2 the base assembly (60). To staple pieces of paper (not shown) together, the pieces  
3 of paper are pushed into the front recess (611) to touch and push the trigger (63)  
4 to activate the switch. The control circuit energizes the staple driver solenoid that  
5 produces an electromagnetic force that drives the metal staple driver downward.  
6 The moved staple driver will strike and drive a staple through the paper.

7 However, the conventional electric stapler only has a single trigger (63)  
8 that is typically located at the right side of the base. The pieces of paper must be  
9 pushed straight into the front recess (611) so the paper strikes the trigger (63).  
10 However, the one-sided trigger (63) does not allow a person to staple pieces of  
11 paper together at a corner. Therefore, application of the conventional electric  
12 stapler is limited. Operation of the conventional electric stapler is particularly  
13 inconvenient for a left-handed person, because the trigger (63) is typically  
14 located at the right side of the base.

15 Because the conventional electric stapler uses the limit switch to trigger  
16 the staple driver solenoid, activating the limit switch often requires a larger force  
17 to push the trigger (63). When only two or three pieces of paper are stapled  
18 together, the paper cannot smoothly push the trigger (63). Therefore, operation  
19 of the conventional electric stapler is also inconvenient when only a few pieces  
20 of paper are stapled together.

21 To overcome the shortcomings, the present invention provides an  
22 electric stapler having a double trigger to mitigate or obviate the aforementioned  
23 problems.

24 **SUMMARY OF THE INVENTION**

1           The main objective of the invention is to provide an electric stapler that  
2   allows pieces of paper to be stapled in arbitrary ways such that the electric stapler  
3   is convenient to use for both right-handed and left-handed people.

4           Other objectives, advantages and novel features of the invention will  
5   become more apparent from the following detailed description when taken in  
6   conjunction with the accompanying drawings.

7   **BRIEF DESCRIPTION OF THE DRAWINGS**

8           Fig. 1 is a side plan view in partial section of an electric stapler in  
9   accordance with the present invention;

10          Fig. 2 is an enlarged perspective view of a stapling recess in the electric  
11   stapler in Fig. 1;

12          Fig. 3 is an exploded perspective view of a photoelectric switch in the  
13   electric stapler in Fig. 1;

14          Fig. 4 is an operational perspective view of the electric stapler in Fig. 1;  
15   and

16          Fig. 5 is a perspective view of a conventional electric stapler in  
17   accordance with the prior art.

18   **DETAILED DESCRIPTION OF PREFERRED EMBODIMENT**

19          With reference to Figs. 1 and 2, an electric stapler (not numbered) in  
20   accordance with the present invention comprises a body (10), a stapling  
21   mechanism (20) and a control circuit device (30). The body (10) has a front (not  
22   numbered), a left side (not numbered), a right side (not numbered), an interior  
23   cavity (not numbered) and a stapling recess (101). The stapling recess (101) is  
24   defined through the front.

1       The stapling mechanism (20) is conventional, is mounted in the interior  
2 cavity of the body (10) and has a staple driver solenoid (21) and a staple  
3 magazine (22). The staple driver solenoid (21) has a coil (210) and a metal staple  
4 driver (211). The coil (210) connects electrically to and is selectively energized  
5 by the control circuit device (30). The metal staple driver (211) has a bottom end  
6 (not numbered), is movably mounted in the coil (210) and moves downward  
7 when the coil (210) is energized.

8       The staple magazine (22) holds and indexes staples (not shown) to be  
9 stapled and has a track (221) slidably mounted in the stapling recess (101) in the  
10 body (10) on which staples are mounted. When the track (221) is pushed into the  
11 stapling recess (101), a staple on the outermost end of the track (221) is aligned  
12 with the bottom end of the metal staple driver (211). Therefore, the downward  
13 movement of the metal staple driver (211) can drive a staple through multiple  
14 pieces of paper and fasten them together.

15      With reference to Figs. 2 and 3, the control circuit device (30) is  
16 conventional and has a switch (not numbered) such as a conventional  
17 photoelectric switch (31) and a circuit board (not numbered). The photoelectric  
18 switch (31) comprises a mounting bracket (311), a pivot cylinder (312), a trigger  
19 (313), a torsional spring (314), a photoelectric detector (315) and a photoelectric  
20 emitter (318).

21      The mounting bracket (311) is mounted on the circuit board and has a  
22 transverse slot (317), a first window (not numbered) and a second window (not  
23 numbered). The transverse slot (317) has two opposite sidewalls (not numbered).  
24 The two windows are defined respectively through the sidewalls and are aligned

1 with each other. The photoelectric detector (315) and the photoelectric emitter  
2 (318) are mounted in the mounting bracket (311) respectively behind the  
3 windows, connected electrically to the circuit board and correspond to each other  
4 through the windows. Therefore, lights produced by the photoelectric emitter  
5 (318) will be detected by the photoelectric detector (315) to produce an electric  
6 current transmitted to the circuit board.

7       The pivot cylinder (312) is pivotally mounted on the mounting bracket  
8 (311) with the torsional spring (314) that will provide a restitution force to return  
9 the pivot cylinder (312) to an upright rest position. The pivot cylinder (312) has a  
10 bottom blade (316) movably mounted in the transverse slot (317) between the  
11 photoelectric emitter (318) and the photoelectric detector (315) to block the  
12 transmission of light. When the pivot cylinder (312) is pivoted, the bottom blade  
13 (316) will be pivoted and allow the light produced by the photoelectric emitter  
14 (318) to be sensed by the photoelectric detector (315). When the photoelectric  
15 detector (315) detects the light, the photoelectric detector (315) produces an  
16 electric current and sends a trigger signal to the control circuit device (30) to  
17 energize the coil (210). The energized coil (210) will produce an electromagnetic  
18 force to drive the metal staple driver (211) to staple paper under the metal staple  
19 driver (211).

20       The trigger (313) is U-shaped and has a cross bar (not numbered), two  
21 parallel arms (not numbered) and a bottom coupling (not numbered). The cross  
22 bar is transversely mounted in the stapling recess (101) from the left side to the  
23 right side of the body (10) and has a proximal end (not numbered) and a distal  
24 end (not numbered). The arms are formed respectively at the ends of the cross

1 bar and are perpendicular to the cross bar. The bottom coupling is formed at  
2 proximal end of the cross bar and is connected to the pivot cylinder (312).

3 With reference to Figs. 1, 3 and 4, pieces of paper can be pushed into the  
4 stapling recess (101) from any direction relative to the stapling recess (101) to  
5 strike either the cross bar or the parallel arms of the trigger (313). Thereafter, the  
6 trigger is pivotally rotated to drive the pivot cylinder (312) to rotate, and the  
7 bottom blade (316) is moved away from the transverse slot (317) to activate the  
8 photoelectric switch (31) to operate the stapler. Operating the electric stapler in  
9 accordance with present invention is convenient even for left-handed people,  
10 because the paper can be pushed into the stapling recess (101) in any orientation  
11 to touch the trigger (313) to switch on the photoelectric switch (31). If there are  
12 only two or three pieces of paper being inserted into the stapling recess (101) to  
13 strike the trigger (31), a large force to push the trigger (31) is not required.  
14 Because to push the trigger (31) to rotate only needs a force for overcoming the  
15 restitution force caused by the torsional spring (314), the torsional spring (314)  
16 can be selected to a suitable one that produces a smaller restitution force.  
17 Therefore, the electric stapler in accordance with the present invention will  
18 staple smoothly a few of paper together.

19 When the photoelectric switch (31) is switched on, the control circuit  
20 device (30) will energize the coil (210) and drive the staple driver (211) to staple  
21 the paper. Consequently, the shortcomings of the conventional electric stapler  
22 will be overcome by the stapler in accordance with present invention that is  
23 really convenient for both the right-handed and left-handed people.

24 Even though numerous characteristics and advantages of the present

1 invention have been set forth in the foregoing description, together with details  
2 of the structure and function of the invention, the disclosure is illustrative only,  
3 and changes may be made in detail, especially in matters of shape, size, and  
4 arrangement of parts within the scope of the appended claims.